

C. H. GILBERT CRUISE 74, August 1964

This cruise was designed to study the fish species present in ocean currents at this time of year. The fish were to be found by observing bird flocks, especially terns, which seem to follow fish schools more closely. Dayle Husted (S. I. personnel) boarded ship at Kaileua, Hawaii, August 14, 1964. The cruise covered the area around Hawaii, north of the Hawaiian chain to Kauai, the channel between Kauai and Niihau, and northwestward to south of Nihoa, then back to Honolulu on August 23. Dayle Husted was to observe the feeding behavior of the birds of the various flocks.

FEEDING BEHAVIOR OF BIRDS IN FLOCKS

Wedge-tailed Shearwater

Wedgetails were observed feeding in two major ways - either sitting on the water and dabbling or flying above the water and diving into the water. When sitting on the water they keep the wings folded, paddle around and put their head and neck under water to feed. When flying above the water, they dive to just above the water and put their head and neck under the water. During this action their wings are continuously beating. After sitting on the water they take off by lifting their heads out of the water and run along the surface until becoming airborne. The dives were not very deep-- probably less than a foot-- and lasted 3 or 4 seconds or less. Some Wedgetails were observed to alight on the water, keep their wings beating, or raised above their bodies, thrust the head and neck under water, and then take flight after a short run.

### Newell's Shearwater

Only one flock of Newell's was observed feeding. These birds fed in similar fashion to the Wedgetail, but between dives to the water they do not arc up as high between dives to the water. Most of the arcs observed were under 15 feet above water level. They also turned on their sides more often, similar to Petrel flight. Newell's is also more maneuverable than the Wedgetail. When it dives down to the water it keeps its wings beating, puts its head and neck under water, then takes off with a much shorter run than a Wedgetail, or almost no run at all. No Newell's were observed sitting in the water in this particular flock, but they were observed sitting in the water singly or in pairs.

### Noddy Tern

In the flocks observed, Noddy Terns stayed low to the water, usually 8 feet at the highest. When feeding they dove to just above the water and hovered above it. With wings beating continually, they put their heads into the water to feed. They then rose almost vertically above the water. Noddy Terns were also observed sitting on the water just dabbling around. Noddy Terns also followed along behind the ship as bait was being thrown out. The Noddies would grab the bait almost as soon as it hit the water. Noddy Terns were more maneuverable than the Shearwaters.

### Hawaiian Noddy Tern

Hawaiian Noddies fed almost identically like Common Noddies. They stayed low to the water and were also very maneuverable. Both occurred in the same flocks and from a distance it was very difficult to distinguish the two species.

### Blue-gray Noddy

Blue-gray Noddies, nearly all immatures, were observed in one flock. Blue-grays occurred with both Hawaiian and Common Noddies. They stayed low to the water, were very maneuverable and seemed to have faster wing beats than the other Noddies, but that may be due to their smaller size. They seemed to be able to hover above the water but their wings were beating all the time. The Blue-grays were observed to put their heads or only their bills into the water. None were observed sitting on the water.

### Sooty Tern

Sooties were observed to stay above the other terns and often above the Shearwaters. They would then drop down to feed like the Noddies. No Sooties were observed sitting on the water. After they had eaten they would rise back above the other birds. The process of going down to the water and then rising back up was repeated many times by the birds while they were being observed.

### Fairy Tern

In the flocks observed, Fairy Terns fed like Sooty Terns, staying above the other birds and then dropping down to feed and then rising again. Fairy Terns were also observed flying low to the water but not in flocks. No birds were observed sitting on the water.

### Brown Booby

Brown Boobies were observed to sit on the water and dabble around. They also swooped around over the water with both low and high arcs. When a fish or other food was spotted they seemed to collapse in mid air and dove straight into the water.

### Red-footed Booby

Red-foots were observed to feed almost exactly like Browns. They both sat on the water and dabbled and also flew over the water until a fish or other food was spotted and then dove almost vertically into the water.

### Feeding Flock Structure

In the flocks observed, each species seemed to consistently occupy the same position within the flock. Frigatebirds for example stayed above the main feeding flock -- often 200 yards above the flock. In one flock frigates were observed to come down to the level of the other species. Sooty and Fairy Terns stayed above the flock but were constantly diving down to the water and coming back up above the other birds. Common, Hawaiian and Blue-gray Noddies stayed just above the water surface following the fish school very closely. Wedge-tailed and Newell's Shearwaters were observed to follow the action of the terns but also flew around the area, neither staying up with the terns nor the fish school. Both species of booby flew all over the area; sometimes flying up with the Sooty and Fairy Terns; other times flying lower with the various Noddies.

TABLE I

<u>Date</u>	<u>Total Sightings</u>	<u>Total Birds</u>	<u>Birds/ Sighting</u>	<u>Total Flocks</u>	<u>Total Birds in Flocks</u>
Aug. 14	24	73	3.04	1	50
15	31	45	1.45	0	0
16	56	455	8.13	14	363
17	94	1643	16.62	18	117 <sup>7</sup> <sub>4</sub>
18	0	0	0.0	0	0
19	132	1591	12.05	15	1266
20	8	25	3.13	0	0
21	165	994	5.72	10	674
22	94	4908	52.21	2	3366
23	36	131	3.64	2	58
Total	640	9865		62	6954
Aver.	64	986.5	15.41	6.2	695.4



TABLE II

Species	Day (Aug.)										Total Species
	14	15	16	17	18*	19	20	21	22	23**	
Wedgetailed Shearwater	56	22	120	588	0	825	12	390	1294	73	3380
Newell's Shearwater	0	0	0	0	0	14	0	106	0	3	123
Christmas I. Shearwater	0	0	0	1	0	0	0	0	0	0	1
Bulwer's Petrel	14	2	22	3	0	3	0	13	532	0	589
Bonin I. Petrel	0	0	3	2	0	0	0	5	0	3	13
Dark-rumped Petrel	0	5	0	1	0	0	0	1	0	0	7
White-necked Petrel	0	0	1	0	0	0	0	0	0	0	1
Harcourt's Storm Petrel	0	0	0	0	0	4	0	9	0	0	13
Sooty Storm Petrel	0	0	0	0	0	0	0	0	13	0	13
Petrel sp.	1	0	0	5	0	0	0	0	0	2	8
Shear-Petrel	1	10	22	11	0	50	4	49	3	13	163
Storm Petrel sp.	0	0	0	0	0	0	0	0	2	0	2
Albatross sp.	0	0	0	1	0	0	0	0	0	0	1
Brown Booby	0	0	0	1	0	42	0	31	39	0	113
R.F. Booby	0	0	0	30	0	38	0	17	1	8	94
Masked Booby	0	0	0	12	0	0	0	0	0	0	12
Booby sp.	0	0	0	7	0	7	0	1	2	0	17
Noddy Tern	0	0	207	639	0	550	0	330	2405	21	4152
Hawaiian Noddy Tern	0	0	20	50	0	40	0	0	100	0	210
Blue-gray Noddy	0	0	0	0	0	0	0	0	431	0	431
Sooty Tern	0	0	39	285	0	4	0	29	65	8	13
Fairy Tern	0	0	0	0	0	0	0	7	21	0	28
Tern sp.	0	0	3	0	0	0	0	0	0	0	3
R.T. Tropicbird	0	0	6	2	0	5	8	2	0	0	23
W.T. Tropicbird	0	23	1	0	0	0	0	1	0	0	6
Tropic sp.	0	3	2	1	0	3	1	1	0	0	11
Great Frigate	1	0	9	2	0	6	0	2	0	0	20
Shorebird sp.	0	0	0	1	0	0	0	0	0	0	1
Total	73	45	455	1643	0	1591	25	994	4908	131	9865

\* 18th of August was spent in Nawiliwili Harbor

\*\* Observations were ended at 1200 on August 23

TABLE III  
OCEANOGRAPHIC DATA

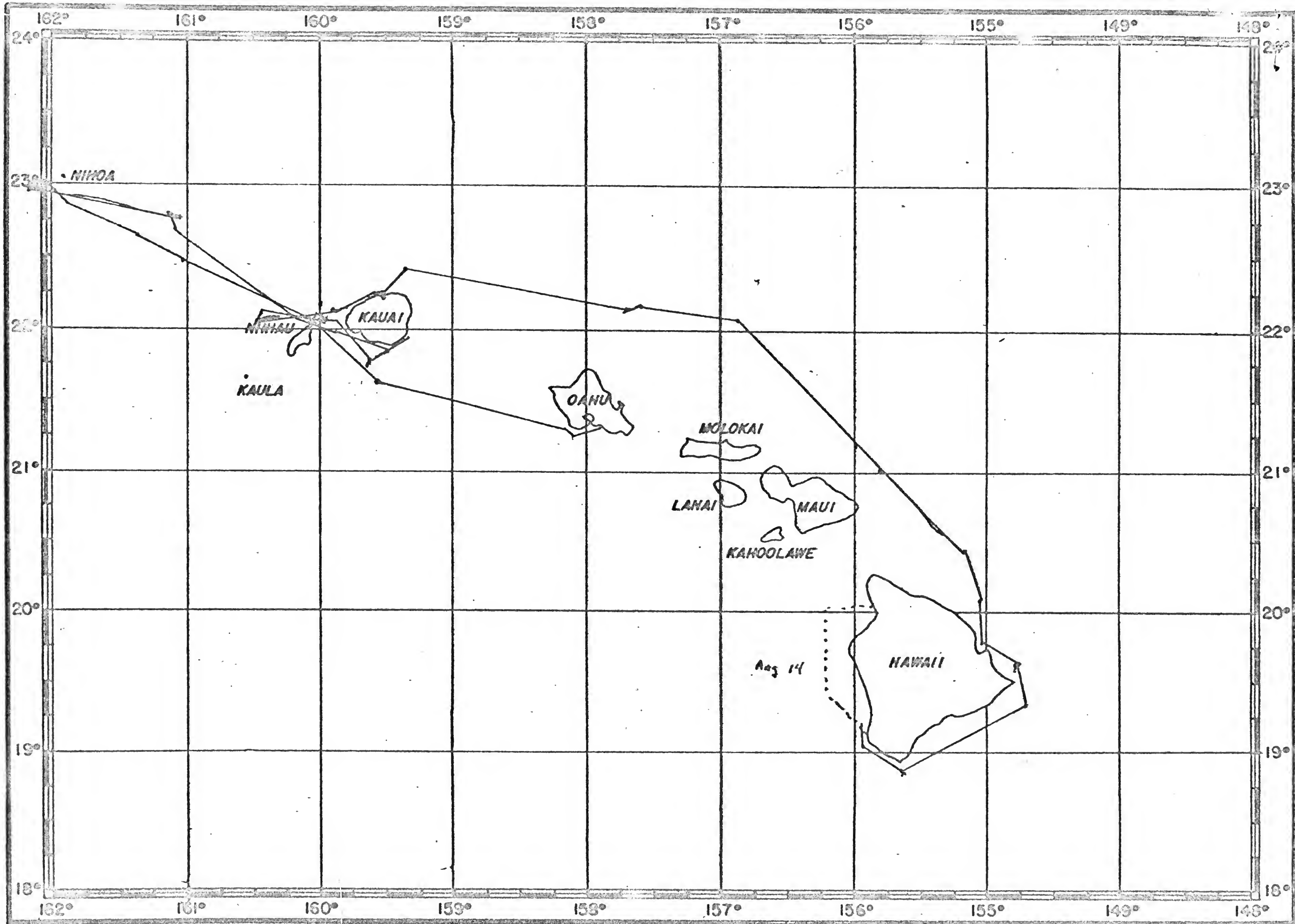
Date	8-14-64	Surface Temp.	27.4
		Wind Speed	23 mph
Time	1638	Wind Direction	50°
		Barometer	1013
Position	20°00' N, 156° 02' W	Weather	03
		Sea	1
		Visibility	9
		Dry Bulb	27.2
		Wet Bulb	23.3
		Cloud Type	8
		Cloud Amt.	4
Date	8-19-64	Surface Temp.	21.6
		Barometer	1018
Time	1010	Weather	03
		Sea	3
		Visibility	9
		Dry Bulb	26.7
		Wet Bulb	23.3
		Cloud Type	8
		Cloud Amt.	4
Date	8-21-64	Surface Temp.	26.7
		Barometer	1013
Time	1009	Weather	02
		Sea	2
		Visibility	9
		Dry Bulb	26.9
		Wet Bulb	23.1
		Cloud Type	8
		Cloud Amt.	3
Position	22° 02' N, 160° 03' W		
Flock No. I			

TABLE III (cont.)

Date	8-21-64	Surface Temp.	26.1
		Barometer	1012
Time	1720	Weather	02
		Sea	1
Position	22° 29' N, 160° 42' W	Visibility	9
		Dry Bulb	25.8
Flock No. II		Wet Bulb	21.7
		Cloud Type	8
		Cloud Amt.	2

Date	8-22-64	Surface Temp.	26.2
		Barometer	1016
Time	0810	Weather	02
		Sea	2
Position	22° 29' N, 162° 08' W	Visibility	9
		Dry Bulb	26.1
		Wet Bulb	22.6
		Cloud Type	8
		Cloud Amt.	3

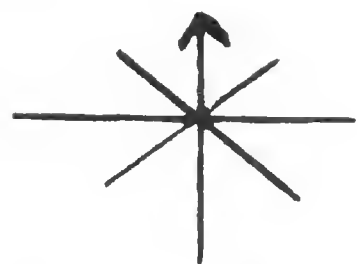






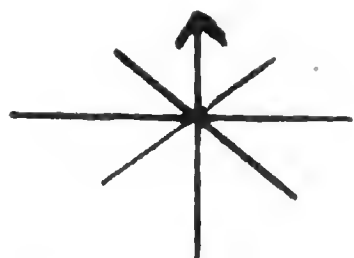
DATE Aug 14, 1964  
Pg. # 18

time	species	#	dir.	hgt.	remarks	loc.
1232	Begin observations					
1255	Wedgetail	1	W			
1322	Wedgetail	1	W			
1355	Porpoises?	Playa around	beach			
1401	Wedgetail	1	NW			
1405	Wedgetail	1	NE			
1408	Wedgetail	2	NE			
1410	Wedgetail	1	W			
1413	Wedgetail	1	NW			
1415	Wedgetail	2	N			
1416	Bulwers Petrel	1	N			
1424	Wedgetail	2	N			
1430	Passed through	a fairly large school of porpoises, about 30				
1458	Great Frigate	1	N			
1502	Wedgetail	1	⊙			
1508	Wedgetail	1	N			
1515	Shear-Petrel	1	E			
1520	Bulwers Petrel	1	NE			
1547	Bulwers Petrel	1	N			
1549	Wedgetail	1	⊙			
1600	Petrel sp	1	N		Either a Leach's or a Harcourt's or a Bulwers - long wings off	
1610	Wedgetail	1	N			
1625	Shearwaters - <del>School</del> Flock				heading toward it - 1 he capt. says Terns follow lead of bird school, 5 shearwaters dawdle around bird school.	
1638	in Flock 40 <del>30</del>				Dark and light wedgetails <del>about</del> 4 dark. <del>many</del> <del>at</del> <del>outskirts</del> 77 fish caught Fish school moved around a bit, The Shearwaters were feeding on squid or flying fish	
1847	Bulwers Petrel	1	W			
1915	End observations					



DATE 15 Aug 64  
Pg. # 1

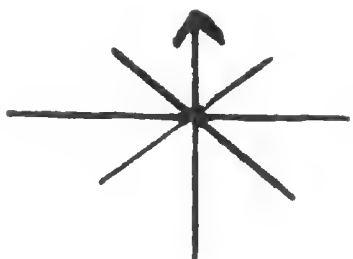
time	species	#	dir.	hgt.	remarks	loc.
0630	Begin Observations					
	Heading in towards Kaula (Kaula) for Bait fish					
0725	Wedgetail	2	N			
0728	Wedgetail	1	S			
0956	White T. Tropicbird	1			Landed on cliff face	in Kealahou Bay - cliffs by Capt. Cooks marker.
1001	W.T. Tropicbird	2			circling cliff	
1308	Bulwer's Petrel	1	SW			
1350	Tropicbird sp	3	SW			circling around a lava flow
1354	Wedgetail	1	SW			
1406	Shear-Petrel	1	S			long way off. Probably a Wedgetail
1510	Wedgetail	2	NW			
1525	Wedgetail	1	S			
1532	Bulwer's Petrel	1	S			
1541	Wedgetail	2	SE			
1543	Shear-Petrel	1	SW			
1554	Wedgetails	4	SW			
1559	Wedgetail	1	SW			
1608	Wedgetail	1	S			
1610	Shear-Petrel	1	W			
1614	Shear-Petrel	1	SW		Seen by watch	
1620	Wedgetail	1	W			
1622	<del>DRP</del> <del>Bulwer's P</del>	2	W			
1630	Wedgetail	1	W			
1634	Shear-Petrel	2	W		Seen by watch	
1647	Wedgetails	2	E			
1654	Dark rumped P	1	SE			
1655	Shear-Petrel	2	W		in the sun	
1657	Dark rumped P	2	SE		Very close to ship	
1700	Wedgetail	1	SE			
1704	Shear-Petrel	1	W		Believe it was a DRP by its flight, but it was in the sun	
1726	Wedgetail	1	E			
1732	Wedgetail	1	E			
1835	Shear-Petrel	1	SE			
1840	End Observations					



DATE 16 Aug 64  
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0530	Begin Observations					
0618	Wedgetail	1	S			
0630	Noddy Tern	35	E		Travelling - low to water, but not feeding	
0634	Noddy Tern	5	E		Travelling	
0735	Shear-Petrel	1	W		at last, a bird is seen.	
1110	Bulwer's Petrel	1	NE			
1205	Wedgetail	1	NE			
1211	Wedgetail	1	NE			
1217	Shear-Petrel	3	NW			
1225	Bulwer's Petrel	1	NE			
1228	Noddy Tern	6	NE		Low to water, but travelling.	
1230	Bulwer's Petrel	1	NW			
1234	Noddy Tern	4	N			
RED	R.T. Tropicbird	3			- Very high, not with Terns	
1237	Noddy Tern	4	NE			
1241	Bulwer's Petrel	1	NE			
1245	Wedgetail	1	NE			
1247	Wedgetails	4	NW		Feeding	
	Bulwer's Petrels	2				
1250	Wedgetail	18			Feeding, Terns and Petrels very low to water.	
	Noddy Tern	10				
	Bulwer's Petrel	4				
1258	Wedgetails	10	NW		Feeding, Noddys close to water	
	Noddy Terns	15				
	Bulwer's Petrels	4				
	R.T. Tropicbird	1				
1302	Tropicbird sp	1			seen by Watch	
	Noddy Tern	1				
1304	Wedgetail	1	NW			
1305	Wedgetail	10+	NW	25+	Feeding - The Terns are staying low to water, except for Sooty Terns	
	Noddy Tern	15+		40		
	Sooty Tern	8			3 immatures	
	Bulwer's Petrel	7			in flock at 1314, Fish moving too fast to catch	
	R.T. Tropicbird	1				





DATE 16 Aug 64  
Pg. # 2

time species # dir. hgt. remarks loc.

1337	out of flock.					
1414	Wedgetail	1	NW			
1417	Wedgetail	3	25			
	Noddy Tern	5	6	70		
	Frigate	3				
	Tropicbird sp	1				
	Sooty Tern	20				
1515	Wedgetail	1	NW			
1516	Wedgetail	3	NW			
1519	Wedgetail	4	NE			
	Sooty Terns	6				
	Bonin Is P ?	1				
1522	Wedgetail	3	NW			
1523	Noddy Tern	2	NW			
1525	Noddy Terns	35+	N			
1527	Wedgetail	3	NW			
1531	Shear-Petrel	5	W			
1541	Wedgetail	1				
	Coffee Break					
1550	Shear-Petrel	5	NE			
1603	Wedgetail	3	NW			
1604	Tern sp	3	W			
1608	Shear-Petrel	1	W			
1610	Wedgetail	1	NW			
1611	Wedgetail	2	W			
1612	Bonin Is P	1	NW			
1615	Shear-Petrel	3	W			
1618	Wedgetail	2	W			
1622	Shear-Petrel	3	W			
1640	Wedgetail	2	N			
	Whitemeched P	1				
1658	Bonin Is P	1	N			
1659	Bulwers P	1	NW			
	Chow					
1800	Sooty Terns	5	N			
1804	Wedgetail	2	N			

Feeding Flock - 3 dark wedgetails  
in flock at 14 35 - they took off - in again at 1345,  
Noddys really rise from water easily.

1 dark  
2 immature Travelling

Low in water Feeding

Travelling

Seen by watch - from description it sounds like Bulwers.  
Travelling

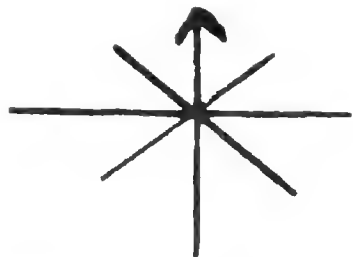
in the sun, from their height I would say Sooty tern

very close to ship which rather surprised me

Travelling

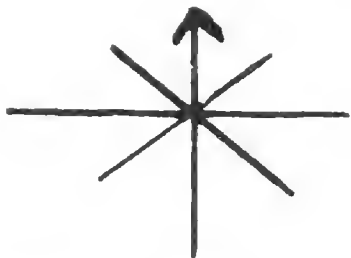






DATE 17 Aug 1964  
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0535	Begin Observations					
0558	Wedgetail	1	NE			
0610	DRP	1	W		Rump dark.	
0623	Sooty Tern	1	E		immature - very mottled on breast	
0625	Tropicbird sp.	1	E			
0628	Wedgetail	1	NW			
0645	R.T. Tropicbird	1	W			
0648	heard Sooty Tern call, but can't find him					
0652	Shear-Petrel	2	NW			
0654	Wedgetail	1	N			
0710	Wedgetail	1	NE			
0715	Wedgetail	2	NW			
0717	Wedgetail	1	NW			
0719	Shear-Petrel	1	NW		Flew more like a DRP.	
0720	W.T. Tropicbird	1	W		Sitting on water	
0721	Wedgetail	1	W			
0724	Wedgetail	1	NE			
0745	Sooty Tern	1	W		immature - no adult present.	
0746	Wedgetail	1	W			
0749	Shear-Petrel	1	W			
0758	Shear-Petrel	1	N			
0759	Wedgetail	1	NW			
0800	Wedgetail	1	W			
0802	Wedgetail	2	W			
0806	Wedgetail	2	NW			
0814	Sooty Terns	12 ± 3	W		Feeding	
	Wedgetails	18 ± 4				
	Petrel sp.?	5 ±				
0817	Wedgetail	1	NW			
0820	Wedgetails	2	W			
0824	Bonin Is P	1	W			
0845	Wedgetail	1	W			
0900	Wedgetail	1	W			
0902	Sooty Tern	9	NE		Travelling - Looked like a small Puffin, dark neck band.	
	Shearbird	1				
0906	Sooty Tern	1	⊙		immature, breast mottled with white	



DATE 17 Aug 64  
Pg. # 2

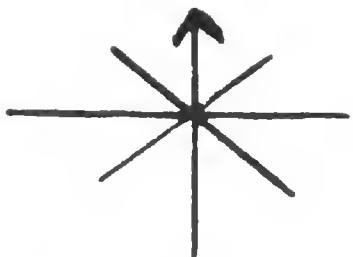
	time	species	#	dir.	hgt.	remarks	loc.
3	0915	Diving chow to flock. in				blocks at 0927	
		Noddy Tern	<del>20</del> 50				
		Sooty Tern	<del>10</del> 30			Feeding	
4		Wedgetail	<del>10</del> 65				
		<del>Griffon</del>					
		Albatross	1				
5		Frigate	1				
	0950	Sooty Tern	3	NW			
	1010	Wedgetail	<del>30</del> 30	NW		Feeding - starting after block.	
6		Sooty Terns	12				
		Noddy Tern	40				
		Masked Booby	<del>5</del> 6			immature	
7	1115	Wedgetail	10			Feeding	
		Sooty Terns	6				
	1155	Sooty Tern	1	W			
8	1158	Shear-Petrel	1	W			
	1157	Wedgetail	1	SW			
	1201	Noddy Tern	1	SW			
9	1208	Bulwer's Petrel	1	SW			
	1254	Wedgetail	1	E			
	1310	Wedgetail	1	SW			
10	1311	Shear-Petrel	3	S			
	1314	Noddy Terns	2	N			
	1315	Wedgetail	3	S			
11	1316	Wedgetail	1	W			
	1317	Wedgetail	2	W			
	1318	Wedgetail	1	SW			
12	1322	Wedgetail	2	S			
	1331	Wedgetail	2	SW			
	1333	Wedgetail	1	SW			
13	1345	Washing toward flock					
		Wedgetails	20			Feeding	
		<del>Common</del> Noddy Tern	35				
14		Masked Booby	2				
		Sooty Tern	10				
	1410	Wedgetail	1	NW			
15	1414	Wedgetail	1	⊙			



DATE 17 Aug 64  
Pg. # 3

	time	species	#	dir.	hgt.	remarks	loc.
	1418	Wedgetail	1	W			
7	1425	Noddy Terns	25			Feeding	
		Wedgetail	20				
		Sooty Terns	5				
		Brown Booby	1				
	1436	Wedgetail	1	W			
	1442	Christmas Is 5	1	N			
8	1502	Noddy Terns	130	W		13 immature Feeding	
		Sooty Terns	40				
		Wedgetail	90				
		Masked Booby	6				
9	1545	Masked Booby	4	SW		Feeding	
		Noddy Terns	20				
		Wedgetail	15				
		Sooty Tern	5				
		R.F. Booby	8+				
10	1552	Wedgetails	40	±5 W		Feeding	
		Noddy Terns	30	±5			
		Sooty Terns	10	±2			
		Masked Booby	2				
		R.F. Booby	6				
	1556	Noddy Tern	1	SW			
	1557	Wedgetail	2	S			
	1559	Wedgetail	1	S			
	1600	Wedgetail	3	NW			
	1604	Wedgetails	2	SW		<del>Feeding</del> note flock	
	1605	Wedgetails	6	NW			
	1606	Noddy Tern	3	NW			
11	1610	Wedgetails	80±	SW		3 dead	
		Noddy Terns	45±				
		Sooty Terns	30			Feeding	
		<del>Booby sp.</del>	<del>2</del>			<del>immature</del>	
		Frigate	1				
		Masked Booby	8			2 immature	
		R.F. Booby	12				
		Wedgetails	50			nothing in water	
		Noddy Terns	90			" "	
		more					
12	1655	Noddy Terns	25	SW		Feeding	
		Wedgetails	20				
		Sooty Terns	12				
		Booby sp.	4				
		R.F. Booby	8				

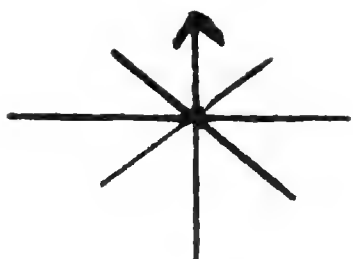
more flocks are coming in to this flock



DATE 17 Aug 64  
Pg. # 4

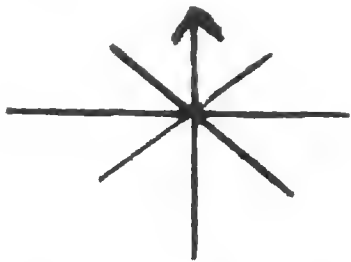
	time	species	#	dir.	hgt.	remarks	loc.
13	1700	Wedgetail	20	NW		Feeding	
		Noddy Tern	35				
		Sooty Tern	5				
		Booby sp.	3				
	1702	Wedgetail	3	SW			
	1703	Bulwers P	1	N			
	1704	Wedgetail	2	S			
	1705	Noddy Tern	2	NW			
	1710	Noddy Tern	1	SW			
	1720	Wedgetail	1	SW			
14	1721	Wedgetail	10	±3 NW		Travelling	
		Noddy Tern	15	±4			
		Sooty Tern	2				
	1722	Wedgetail	1	SW			
15	1728	Wedgetail	15	SW		Feeding	
		Noddy Tern	25				
		Bulwer Booby	2				
16	1732	Wedgetail	12	SW		Feeding	
		Noddy Tern	5	<del>SW</del>			
		Sooty Tern	10	<del>SW</del>			
	1740	Noddy Tern	4	SW			
	1800	R.T. Tropicbird	1	@			
	1812	Wedgetail	2	SW			
	1821	Noddy Tern	2	NW			
	1822	Bulwers Petrel	1	N			
17	1832	Wedgetail	4			Travelling	
		Noddy Tern	3				
	1835	Shear Petrel	1	W			
	1836	Wedgetail	1	NE			
	1843	Wedgetail	2	S			
	1846	Wedgetail	2	SW			
	1851	Wedgetail	1	SW			
	1858	Shear Petrel	2	W			
	1859	R F Booby?	6			Travelling	
	1900	End observations					





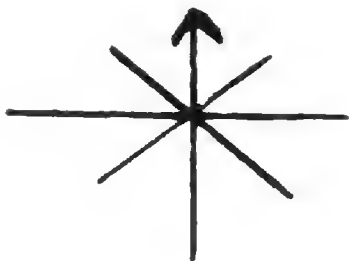
DATE <sup>19</sup> ~~18~~ Aug 64  
Pg. # 1

	time	species	#	dir.	hgt.	remarks	loc.
18	0600	Begin Observations					
		Kauai in sight					
	0900	Begin Observations on 19					
	0901	Wedgetail	2	Honolulu Harbor			
	0903	Wedgetail	1	E		Dark	
	0906	Wedgetail	1	W			
	0908	Wedgetail	2	W			
18	0915	Wedgetail	8	W		Feeding	
	0919	Wedgetail	3	W			
	0920	Wedgetail	1	W			
	0921	Wedgetail	2	E			
	0923	Wedgetail	3	NW			
	0926	Wedgetail	2	NW			
	0932	Wedgetail	3	NE			
	0936	Wedgetail	2	NW			
		Noddy Tern	2				
	0948	Wedgetail	3	NW			
	0950	Wedgetail	4	W			
	0951	Noddy Tern	3	W			
2	1000	Noddy Terns	<del>30</del> 320 ± 60				
		Noddy Terns	2				
		Wedgetail	40	N		Feeding	
		Red Foot Booby	1				
	1047	Tropicbird sp	1	NW			
	1052	R.T. Tropicbird	1	SW			
	1058	Tropicbird sp	2	SW			
3	1059	Wedgetail	6	SW		Feeding	
		Noddy Tern	25 ± 5				
4	1100	Wedgetails	4	N		Feeding	
		Noddy Terns	15				
	1102	Wedgetail	2	N			
	1103	Wedgetail	1	NW			
	1104	Wedgetail	3	SW			
	1106	Wedgetail	2	SW			
	1107	Wedgetail	2	SW			
	1108	Wedgetail	1	W			



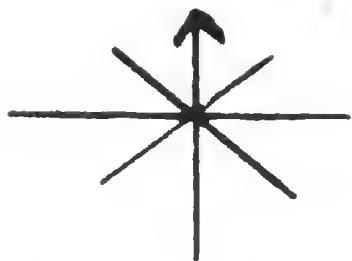
DATE 19 Aug 64  
Pg. # 2

	time	species	#	dir.	hgt.	remarks	loc.
	11 13	R.T. Tropicbird	3	W			
	11 14	R.F. Booby	2	SW			
	11 17	Noddy Tern	1	W			
5 {	11 36	Wedgetails	6	SW		Feeding	
		R.T. Tropicbird	1				
	11 37	Wedgetails	4	W			
	11 38	R.F. Booby	2	S		1 immature	
	11 39	Wedgetail	3	S			
	11 40	Noddy Tern	4	W		Nat a flock	
		Wedgetail	3				
6 {	12 00	Wedgetails	<del>80</del> 250	W		3 Dark.	
		Noddy Terns	180			Feeding	
		Bon. Booby	9				
	12 15	R.F. Booby	1	W			
	12 16	Wedgetail	1	W			
	12 17	Wedgetail	4	SW			
	12 20	Wedgetail	1	W			
	12 32	Wedgetails	35	W		Nat a flock.	
	12 40	Wedgetail	25	W		Nat a flock	
	12 41	Bon. Booby	2	W		sitting on water	
	12 50	Wedgetails	300	± 30 W		6 dark	
7 {		Brown Booby	46			Feeding	
		R.F. Booby	14			6 immatures	
		Sooty Tern	1				
8 {	13 40	Wedgetail	30	W		Feeding	
	13 47	Wedgetail	3	S			
	13 48	Wedgetail	4	W			
	13 49	Wedgetail	2	W			
	13 50	Harcourt's Storm	1	W			
		R.F. Booby	2			Nat a flock.	
		Wedgetail	10				
	13 54	Harcourt's S.T.	2	W		Nat a flock.	
		Newell's Shear	1				
		Sooty Tern	1				
		Wedgetail	5				



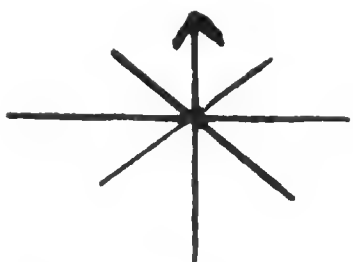
DATE 19 Aug 64  
Pg. # 3

	time	species	#	dir.	hgt.	remarks	loc.
9 {	1403	Wedgetail	12	W		3 dark, feeding.	
	1410	Wedgetail	1	E			
	1412	Wedgetail	3	W			
	1416	Wedgetail	2	W			
	1418	Shear-Petrel	3	W			
	1419	Wedgetail	2	W		Dark.	
	1420	Wedgetail	1	SW			
	1428	Wedgetail	2	W			
	1430	Newell's Shear	1	S			
	1442	Brown Booby	1	SW			
		Wedgetail	3				
	1445	Wedgetail	2	N			
	1448	Shear-Petrels	4	SW			
	1449	Brown Booby	1	⊙			
	1458	Brown Booby	2	⊙			
	1503	Brown Booby	1	⊙		immature	
	1504	R.F. Booby	2	N			
	1506	Wedgetail	1	N			
	1514	Newell's Shearwater	1	N			
	1516	Harcourts SP	1	N			
	1517	Brown Booby	2	⊙			
	1520	Bulwer's P	1	SW			
	1522	R.F. Booby	1	SW			
	1523	Sooty Tern	2	SW			
10 {	1524	Shear Petrel	15	SW		Feeding, probably Wedgetails	
	1525	Wedgetail	3	W			
11 {	1528	Shear-Petrel	20	W		Travelling, probably Wedgetails	
	1530	Brown Booby	2	sitting in rigging			
	1538	Wedgetails	3	SW			
	1542	Newell's Shearwater	1	S			
12 {	1547	Wedgetails	35	SW			
		Frigate	4			Feeding	
		Booby sp	6			Immature	
		Noddy Tern	40				
	1550	R.F. Booby	2				
	1551	Newell's S	1	S			



DATE 19 Aug 64  
Pg. # 4

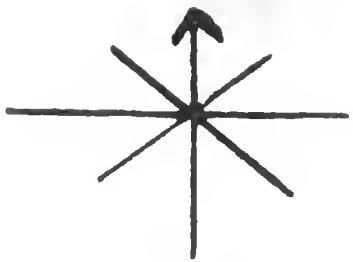
time	species	#	dir.	hgt.	remarks	loc.
1553	Wedgetail	3	N			
1554	Wedgetail	2	S			
1555	R.F. Booby	1	N			
1558	Wedgetail	1	N			
1600	Wedgetail	1	S			
1602	Wedgetail	2	N			
1603	Bon. Booby	3	sitting on water immatures			
1610	Newells S	1	N			
1612	Newells S	1	SW			
1615	Wedgetail	3	W			
1619	Newells S	1	N			
1622	Bulwers P	1	N			
1623	Wedgetail	2	NW		sitting on water	
1626	Wedgetail	2	N			
1638	Shear. Petrel	2	E			
1641	Wedgetail	1	E			
1655	Wedgetail	2	SE			
1657	R.F. Booby	1	SW			
1658	Bulwers P	1	NW			
1659	Shear. Petrel	1	NW			
1700	Wedgetail	1	NE			
1703	Wedgetail	1	NE			
1704	Newells S	1	NW			
1705	Brown Booby	1	NE			
1708	Bon. Booby	2	NE		immature	
1710	Newells Shear	1	S			
1711	Wedgetail	1	NW			
1712	Wedgetail	3	N			
1713	Bon. Booby	1	S			
1718	Bon. Booby	3	SE			
1745	Wedgetail	1	S			
1748	Wedgetail	3	W			
1755	Newells Shear	1	E			
1805	Booby sp	1	E		immature	
1806	Wedgetail	2	W			
1809	Wedgetail	14	E		next a flock.	
1811	R.F. Booby	1	S			



DATE 19 Aug 64  
Pg. # 5

	time	species	#	dir.	hgt.	remarks	loc.
	1814	Wedgetail	1	E			
	1817	Wedgetail	3	N			
	1818	Wedgetail	2	N			
	1819	Newell's Shear	1	S			
14 {	1820	Wedgetail	100 ± 20			5 immatures	
		R.F. Booby	8			Feeding	
		Bon Booby	3			2 immatures	
	1830	Frigate	2	E			
	1832	Wedgetail	1	E			
	1834	Wedgetail	4	N			
	1835	Wedgetail	2	N			
15 {	1841	Shear-Petrel	5	N		Travelling	
	1843	Bon Booby	3	S			
	1850	Wedgetail	1	S			
	1855	Wedgetail	12	S	not a	stock.	
	1900	End Observations					



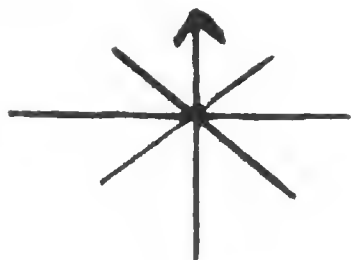


DATE 20 Aug 64  
Pg. # 1

time species # dir. hgt. remarks loc.

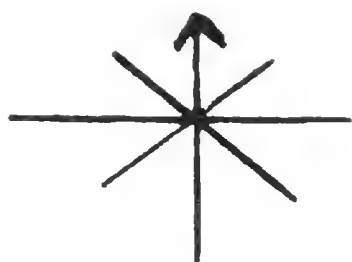
0530 Begin Observations  
Heading into Nawiliwili Harbor  
0538 Shear. Petrel 1 SW  
0554 Wedgetail 1 SW  
0604 Shear. Petrel 3 E  
0628 Wedgetail 8 E  
0630 Wedgetail 2 E  
0632 Wedgetail 1 W  
0637 Tropicbird sp 1 NW  
0705 RTV Tropicbird 8 on cliffs  
0810 in port, E not observations

Travelling



DATE 21 Aug. 64  
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0630	Begin observations (leaving port)					
0638	Wedgetails	3	W			
0645	Wedgetail	2	NW			
0650	Wedgetail	1	W			
0652	Bulwers P	1	S			
0654	Wedgetail	3	W			
0659	Wedgetail	1	SW			
	Noddy Tern	2				
0710	Wedgetail	3	W			
0730	Wedgetail	1	S			
0731	Wedgetail	1	W			
0740	Wedgetail	1	SW			
0744	Wedgetail	1	SW			
0748	Wedgetail	1	N			
0749	Wedgetail	1	N			
0756	Wedgetail	1	W			
0758	S. horn Petrel	1	SW			
0759	Wedgetail	1	SW			
0803	Wedgetail	1	SW			
0804	Wedgetail	1	N			
0805	Wedgetail	1	N			
0809	Wedgetail	8	N		met a black	
0810	Bulwers P	1	N			
0812	Wedgetail	1	S			
0813	Wedgetail	3	SW			
0817	Wedgetail	4	W			
0823	Wedgetail	3	SW			
0828	Wedgetail	2	N			
0829	Wedgetail	2	SW			
0833	Wedgetail	4	N			
1 0840	Wedgetail	10	SW		Sitting on water Feeding	
2 0844	Wedgetail	6	SW		Sitting on water - not doing much of anything	
0847	Wedgetail	3	SW			
0850	Wedgetail	3	W			
0852	Wedgetail	4	NW			
0853	Wedgetail	1	SW			
	Noddy Tern	1				
0854	Sooty Tern	1	NW			



DATE 21 Aug 64  
Pg. # 2

time species # dir. hgt. remarks loc.

0956 Sooty Tern 1 NW

0959 Wedgetail 2 NW

0900 Wedgetail 3 SW

0901 Wedgetail 2 SW

Sooty Tern 1

0902 Newell's 1 SW

0903 Wedgetail 3 W

0905 W.T. Tropicbird 1 N

0906 Wedgetail 2 SW

0911 Brn. Booby 1 SW

0914 Wedgetail 2 NW sitting on water

0916 Wedgetail 1 SW

0917 Shear-Petrel 3 W

0918 Wedgetail 1 NW

0924 Wedgetail 3 SW

0928 Wedgetail 6 W note black.

0929 Noddy Tern 1 N

0934 Noddy Tern 3 NW

0935 Wedgetail 1 SW

Noddy Tern 1

0936 Wedgetail 2 W 1 dark

0940 Wedgetail 3 NW

0949 Wedgetail 1 NW

0950 Wedgetail 2 SW

0954 Harcourt's SP 1 SW

0955 Bulwer's P 1 SW

Wedgetail 3 W

0957 Wedgetail 1 S Dark.

0959 Wedgetail 4 NW

1001 Harcourt's SP 1 W

1002 Harcourt's SP 4 SW

1003 Wedgetail 50 60 dark

Noddy Tern 40

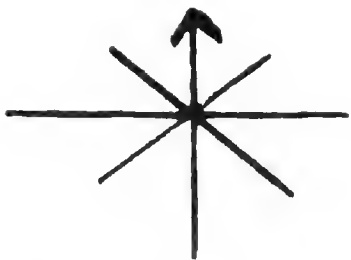
Brn Booby 3

R.F. Booby 2 immature

Newell's S 90+

Bonin Is P 5

3  
Newell's feeds something like a wedgetail. It does not ~~take~~ are up as high, it stays lower, it is more maneuverable down on the water also. It appears to be able to take off the water faster than a wedgetail also.

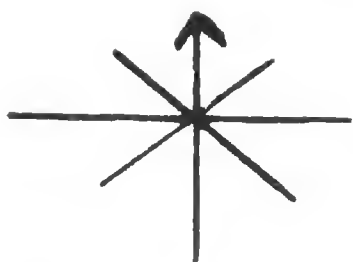


DATE 21 Aug 64  
Pg. # 3

included  
detent  
Hawaii &  
Nikau

time species # dir. hgt. remarks loc.

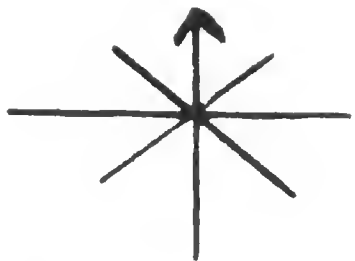
	1028	Wedgetails	15	W		Nata flock	
	1032	Harcourts SP	1	W			
	1033	Brn Booby	1	W	immature		
	1038	Wedgetail	41	SW			
	1039	Wedgetail	3	NW			
	1040	Wedgetail	50±	SW	sitting on water, 2 dark.		
	1042	Bulwers P	1	W			
	1043	Wedgetail	1	SW			
	1046	Wedgetail	3	SW			
	1048	Wedgetail	3	W	sitting on water		
	1049	Harcourts SP	1	SW			
	1050	Sooty Tern	1	NW			
	1051	Wedgetail	4	NW			
	1052	Shear-Petrel	12	NW		Nata flock.	
	1100	Wedgetail	3	SW			
	1101	Wedgetail	1	SW			
	1102	Wedgetail	3	NW			
	1103	Wedgetail	1	SW			
	1104	Wedgetail	2	W			
	1105	Newell's S	1	W			
	1107	Brn. Booby	1	S			
	1111	Wedgetail	2	SW			
	1113	Bulwers P	1	NW			
	1114	R.T. Tropicbird	1	SW			
	1115	Wedgetails	3	SW			
	1116	Sooty Tern	2	NW			
	1117	Brn Booby	1	SW			
	1130	Brn Booby	3	⊙	2 immature		
5	1138	Wedgetails	6	W		Travelling	
	1141	Brn Booby	2	⊙			
	1146	Wedgetails	4	W			
	1147	Wedgetail	3	SW			
	1150	Wedgetail	4	SW			
	1151	R.F. Booby	3	NW			
	1152	R.T. Tropicbird	1	NW			
6	1200	Wedgetails	15	SW			
		Noddy Terns	175			Feeding	
		Brn Boobys	7				
		Frigate	1				
7	1240	Wedgetails	20				
		Noddy Terns	100			Feeding	



DATE 21 Aug 64  
Pg. # 4

time	species	#	dir.	hgt.	remarks	loc.
1250	Wedgetail	3	NW			
1251	Noddy Tern	4	W			
1252	Wedgetail	2	W			
1254	BRN Booby	2	⊙			
1255	Wedgetail	3	NW			
1256	Wedgetail	4	NW			
1257	Wedgetail	3	W			
1301	Wedgetail	1	W			
1305	Wedgetail	1	N			
8 1308	Shear-Petrel	20	±W		probably Wedgetails, Feeding	
1310	Noddy Tern	1	SW			
1311	Bulwers P	1	SW			
			W			
1317	Wedgetail	1	W			
1318	Shear-Petrel	3	NW			
1319	BRN Booby	1	⊙		immature	
1320	Wedgetail	1	N			
1321	BRN Booby	1	NW			
1323	Wedgetail	1	W			
1326	BRN Booby	1	NW			
1327	Wedgetail	1	NW			
1331	Wedgetail	3	NW			
1334	Wedgetail	1	W			
1339	Tropicbird	1	N			
1344	Harcourt's SP	1	W			
1345	Wedgetail	1	N			
1348	Bulwers P	1	SW			
1353	Shear-Petrel	2	W			
1355	Bulwers P	1	W			
1359	Shear-Petrel	2	N			
1405	BRN Booby	1	W		Sitting in water	
1410	Wedgetail	2	W			
1415	Newell's S	1	W			
1422	Bulwers P	1	W			
1427	Shear-Petrel	1	N			
1428	Wedgetail	1	SW		Dark	
1429	Wedgetail	3	W			
	Sooty Tern	1				
1430	Frigate	1	W			
1431	BRN Booby	1	N			





DATE 21 Aug 64  
Pg. # 5

time species # dir. hgt. remarks loc.

1435 Wedgetail 1 N

1450 Bulwers P 1 N

1510 Wedgetail 1 N

1520 Wedgetail 1 N

1525 Noddy Tern 2 W

1547 Wedgetail 1 W

1555 Brn Booby 1 N

1601 Newells S 1 N

1607 Wedgetail 2 W

1611 R.F. Booby 1 Ⓞ

1613 Bulwers P 1 W

1614 Sooty Tern 1 W

1616 Brn. Booby 1 NE

1617 Newells S 1 NE

1619 Wedgetail 1 NE

1621 R.F. Booby 1 W

1622 R.F. Booby 1 W

5. km - Petrel 3

1624 Booby sp 1 NW

5 km - Petrel 2 NW

1627 Wedgetail 1 SW

1631 Bulwers P 1 W

1645 Bulwers P 1 W

1647 Newells S 1 N

1710 Wedgetail 20 W

Newells S 4

Sooty Tern 12

Fairy Tern 4

DRP 1

R.F. Booby 8 - 3 immatures

Brn Booby 3

1906 R.F. Booby 1 Ⓞ

1905 Sooty Tern 2 W

~~1907 L<sup>1</sup> observations~~

1915 Newells S 6

Wedgetail 10

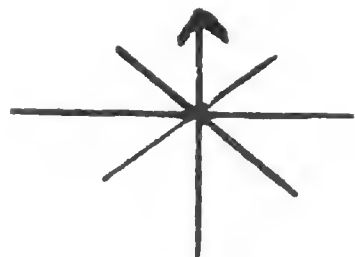
Fairy Tern 3

Sooty Tern 7

1920 L<sup>1</sup> incl Observations

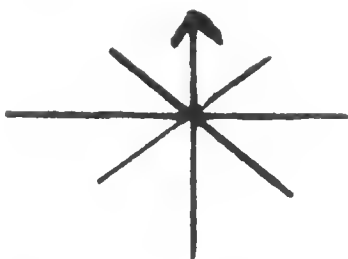
9

10



DATE 23 Aug 64  
Pg. # 1

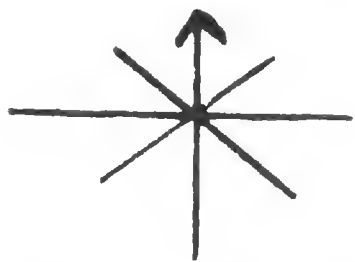
time	species	#	dir.	hgt.	remarks	loc.
0530	Begin Observations					
0550	Wedgetail	1	E			
0613	Wedgetail	2	SE			
0622	Wedgetail	1	SE			
0632	Wedgetail	1	SE			
0635	Shear-Petrel	2	E			
0637	Wedgetail	4	NE			
0638	Sooty Tern	1	NE			
0648	Wedgetail	1	E			
0658	Wedgetail	4	E			
0702	Wedgetail	2	SE			
	Sooty Tern	1				
0705	Wedgetail	1	SE			
0708	Wedgetail	3	SE			
0711	Petrel sp?	2	SE		<del>all</del> All white underneath?	
0712	Wedgetail	3	SE			
0714	Wedgetail	1	E			
0715	Sooty Tern	2	NE			
0731	Wedgetail	1	NE			
0744	Turnstone	3	NW			
0748	Shear-Petrel	1	E			
0809	Wedgetail	18	N		Feeding	
	Sooty Tern	4				
	Noddy Tern	20	S			
0817	Shear-Petrel	3	NE			
0830	Wedgetail	2	NE			
0843	Shear-Petrel	2	SE			
0850	Wedgetail	1	SE			
0858	Wedgetail	4	E			
0917	Shear-Petrel	1	E		seen by watch	
0938	Wedgetail	5	SE		near shore	
0942	Wedgetail	8	SE		Feeding	
	R.F. Booby	8	SE			
0950	Common Noddy	1	SE			
0954	Shear-Petrel	4	S			
1015	Wedgetail	2	E			
1017	Bonin L. P	3	S			



DATE 23 Aug 64  
Pg. # 2

time species # dir. hgt. remarks loc.

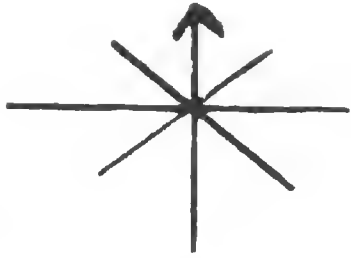
1045	Wedgetail	1	S	Dark	
1049	Wedgetail	1	S		
1105	Wedgetail	2	E		
1112	Wedgetail	4	W		
1200	Endabence	1		off channel ship	



DATE 22 Aug 64  
Pg. # 1

time	species	#	dir.	hgt.	remarks	loc.
0550	Begin Observations					
0558	Wedgetail	2	SW			
0604	Bulwers P	1	NW			
0611	Wedgetail	2	NW			
0616	Bulwers P	1	W			
0617	Bulwers P	2	NW			
0618	Wedgetail	41	W			
	Bulwers P	5			Not a flock	
	Storm Petrel sp	2			Small dark, flew very erratic, Long wingspan.	
0620	Wedgetail	50	W			
	Bulwers P	37			Not a flock may have been seen Sooty Storm Petrels	
0632	Sooty Tern	1	N			
0634	Wedgetail	12	N			
	Bulwers P	5			Not a flock	
0635	Tern sp?	3	N		Looks like a miniature noddy Tern, flies with bluegrey noddy constant wing beats, grey underneath	
0637	Wedgetail	8	NW		2 Dark.	
	Bulwers P	10			Not a flock	
	SSP	2				
0638	Wedgetail	19	NW			
	Bulwers P	15			Not a flock	
	Sooty Tern	1				
0642	Wedgetail	9	NW			
	Bulwers P	8			Not a flock	
0646	Wedgetail	87	NW			
	Bulwers P	71			Not a flock	
					Blue grey noddy	
0647	Tern sp?	2	NW		Head light, underneath light, wings & back dark Bill black and straight	
0650	Wedgetail	94	NW			
	Bulwers P	82			Not a flock	
0652	Tern sp?	3			Blue grey noddy	
0658	Wedgetail	72	NW			
	Bulwers P	41			Not a flock	
0659	Tern sp?	1	N			
0700	Wedgetail	98	NW			
	Bulwers P	67			Not a flock	
	Tern sp?	4			I don't think these are a Tern now Bluegrey noddy	
	Sooty Tern					
almost all birds heading South						

Michael  
directly N



DATE 22 Aug 64  
Pg. # 2

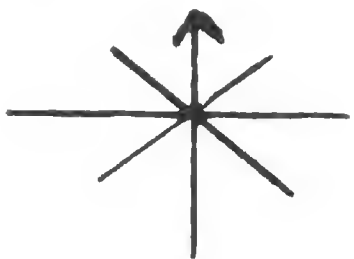
time	species	#	dir.	hgt.	remarks	loc.
0703	Wedgetail	72	NW			
	Bulwers P	54			Not a flock	
	Sooty Tern	2				
0704	Tern sp ?	1	N		it might be a small petrel? - Blue grey noddy	
0707	Wedgetail	44	NW			
	Bulwers P	28			Not a flock	
	Fairy Tern	1				
Brn	Booby	1			immature	
0710	Wedgetail	32	NW			
	Bulwers P	18			not a flock	
0711	Brn Booby	3			immature	
0715	Wedgetail	54	NW		2 dark,	
	Bulwers	20			not a flock	
	Brn Booby	1				
0717	Wedgetail	65	NW			
	Bulwers P	18			Not a flock	
	Brn Booby	4			sitting in water, 2 immature	
	SSP	2				
0720	Wedgetail	15	NW			
	Bulwers P	4			not a flock	
0725	Wedgetail	19				
	Bulwers P	4			not a flock	
	Sooty Tern	1				
0728	Wedgetail	18				
	Bulwers SSP	2			not a flock	
	Brn Booby	7			4 immature	
0729	A. F. Booby	1			immature	
0734	Wedgetail	18	NW			
	Bulwers P	5			Not a flock	
	SSP	3				
0749	Wedgetail	50	NW			
	Bulwers P	9			Not a flock	
	Sooty Tern	1				
0758	Sooty Tern	1	NW			
0810	Tern sp ?	3	NW		Light on breeding edge of wing, Definite Forked Tail but black - B.G. Noddy	
0812	Noddy Tern	5	SW			
	Wedgetail	8			Not a flock	





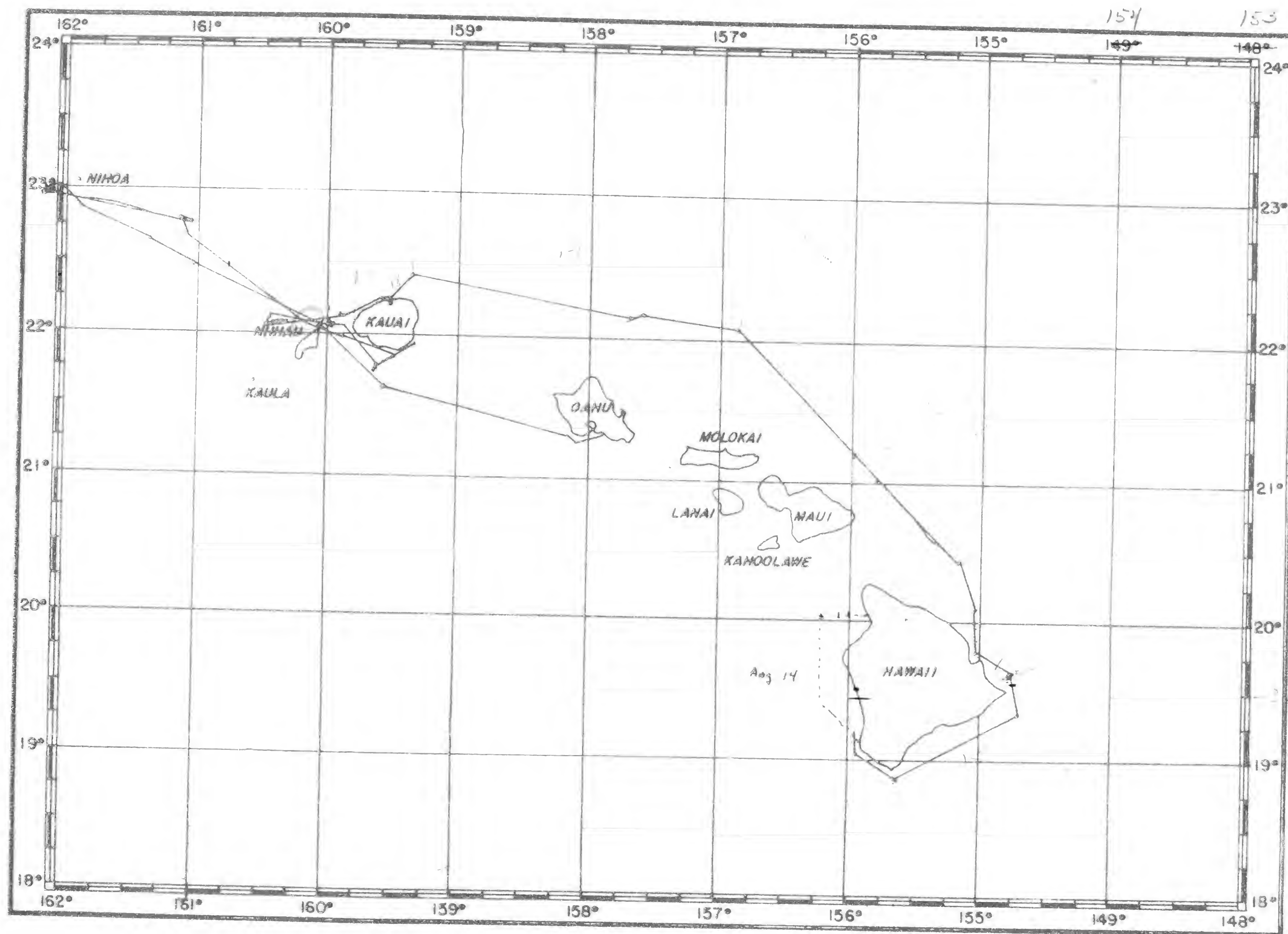
DATE 27 Aug 64  
Pg. # 3

	time	species	#	dir.	hgt.	remarks	loc.
①	0810	Wedgetails	390	±50		Feeding	
		Noddy Terns	2500	±200			
		Sooty Tern	50				
		Fairy Tern	18	±5			
		Tern sp	400	±50		might be ch <del>Wedgetails</del> <del>stays?</del> Blue grey noddy	
		Born Booby	20				
		Out of flock at 0955					
	0958	Bulwers P	3	N			
	1002	Wedgetail	8	N		not a flock	
	1005	Tern sp?	4	W		B.G. Noddy	
	1009	Wedgetail	6	SE		not a flock	
		Born Booby	3				
	1010	Wedgetail	2	S			
	1011	Wedgetail	1	SW			
	1012	Wedgetail	1	SW			
	1013	SSP?	1	SW			
		Bulwers P	3	SW			
	1014	Wedgetail	1	SW			
	1015	Wedgetail	1	N			
	1016	Wedgetail	1	N		Going back by school	
	1017	Wedgetail	1	N			
	1018	Bulwers P	4	N			
	1028	Bulwers P	3	N			
		SSP	2			not a flock	
	1031	Sooty Tern	1	W			
	1037	Bulwers P	4	E			
	1039	Wedgetail	8	NE		not a flock	
	1048	Sooty Tern	3	SE			
②	1050	Tern. Sp.	6	S		Travelling - These must be Immature Blue grey Noddys, but where are the adults?	
	1100	Bulwers P	3	S			
		SSP?	1				
	1115	Wedgetail	3	E			
	1122	Born Booby	1	N			
	1136	Fairy Tern	1	N			
	1148	Wedgetail	1	N			
	1152	Wedgetail	1	NW			



DATE 22 Aug 64  
Pg. # 4

time	species	#	dir.	hgt.	remarks	loc.
1201	Wedgetail	2	E			
1204	Bulwers P	1	NE			
1205	Wedgetail	1	S			
1217	Wedgetail	2	E			
1222	Bulwers P	1	SE			
1235	Wedgetail	1	E			
1241	Bulwers P	1	W			
1242	Bonby sp	1	E		immature	
1305	Shear-Petrel	1	W		seen by watch	
1315	Wedgetail	1	E			
1326	Wedgetail	1	E			
1328	Fairy Tern	1	N			
1348	Blue grey Noddy	1	N			
1351	Blue grey Noddy	1	NW			
1404	Bulwers P	1	E			
1409	Blue green Noddy	2	W			
1416	Wedgetail	1	E			
1417	Sooty Tern	1	E			
1428	Wedgetail	2	E			
1437	Wedgetail	1	E			
1445	Bulwers P	1	W			
1447	Bulwers P	1	NW			
1501	Bulwers P	1	W			
1530	Sooty Tern	1	⊙			
1531	Wedgetail	1	SW			
1604	Wedgetail	1	W			
1655	Shear-Petrel	1	W			
1710	Wedgetail	1	E			
1805	Wedgetail	1	S			
1815	Wedgetail	1	N			
1842	Sooty Tern	1	S			
1855	Shear-Petrel	1	W			
1900	End Observations					



M. Esterline - sheet made up in this office from minimal data

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SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 14 Aug 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100																
0200																
0300																
0400																
0500																
0600																
0700																
0800																
0900																
1000																
1100																
1200	20-02	155-52														27/03
1300	20-02	155-54														27/03
1400	20-02	155-56														27 03
1500	20-01	155-58														27 03
1600	20-00	156-00	03		9	1013	27.2			4		1	27.4	23	50	27 03
1700	20-00	156-03														27 03
1800	20-00	156-06														27 03
1900	20-00	156-09														27 03
2000	20-00	156-15														27
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS



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SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 15 Aug 64

	TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
	0100															
	0200															
	0300															
	0400															
	0500															
630	0600	19-26	155-58													
728	0700	19-26	155-58													
1	0800	Koalaheka Bay														
	0900	19-28	155-56													
1000	1000	19-28	155-56													18 / 09
	1100	19-19	155-56													18 / 09
	1200	19-10	155-56													18 / 09
	1300	19-01	155-54													14 / 09
	1400	18-57	155-52													14 / 09
	1500	18-53	44													05 / 09
	1600	18-57	36													05 / 09
	1700	19-01	28													05 / 11
	1800	05	20													05 / 11
	1900	09	12													05 / 11
	2000	13	155-04													05 / 11
	2100	17	154-56													05 / 11
	2200	19-20	48													35 / 11
	2300	19-28	49													35 / 11
	2400	36	52													31 / 11

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
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SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 16 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	19-39	155-00													35 / 06
0200	42	155-05													35 / 6
0300	45	10													35 / 6
0400	48	15													34 / 06
0500	51	20													34
0600	54	25													34 "
0700	57	30													32
0800	20-00	35													32
0900	03	40													32
1000	6	45													32
1100	9	50													
1200	12	55													" "
1300	15	156-00													
1400	18	05													
1500	21	10													
1600	24	15													"
1700	27	20													"
1800	30	25													"
1900	33	30													"
2000	36	35													"
2100	39	40													"
2200	42	45													"
2300	45	50													
2400	20-48	156-55													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 17 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	20-51	157-00													32 / 06
0200	54	05													
0300	57	10													
0400	21-00	15													
0500	03	20													
0600	06	25													
0700	10	30													
0800	14	35													
0900	19	40													
1000	22	45													
1100	26	50													
1200	30	55													
1300	34	158-00													
1400	38	05													
1500	42	10													
1600	46	15													
1700	50	20													32 / 06
1800	54	25													6
1900	58	30													6
2000	22-02	35													
2100	06	40													
2200	10	45													
2300	14	50													
2400	22-18	55													

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 18 Aug 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	22-21	159-00														32 07
0200	24	05														32
0300	27	10														22 07
0400	24	15														22
0500	19	20														22
0600	22-15	159-25														22
0700	22-13	159-30														22
0800																22
0900																
1000																
1100																
1200																
1300																
1400																
1500																
1600																
1700																
1800																
1900																
2000																
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS



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SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 19 Aug 64

TIME	LAT	LONG	PRES WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100															
0200															
0300															
0400															
0500															
0600															
0700															
0800															
0900	22-13	159-38	Hanalei Harbor Kaula'i												23
1000	22-11	159-46	03	9	1018	26.7			4		3	21.6			23
1100	09	52													23
1200	8	56													23
1300	7	160-01													
1400	6	06													
1500	5	01													06
1600	4	16													
1700	3	21													
1800	22-02	26													23
1900	01	31													36
2000	07	31													12
2100	5	26													12
2200	3	21													12
2300	22-01	16													12
2400	21-59	11													12

REMARKS:

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WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 20 Aug 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	21-57	160-06														12
0200	55	160-01														12
0300	53	159-56														12
0400	21-51	49														12 06
0500	50	42														12
0600	49	35														05
0700	53	28														05
0800	21-57	159-21	In Port (Nawiliwili - Kauai)													05
0900																
1000																
1100																
1200																
1300																
1400																
1500																
1600																
1700																
1800																
1900																
2000																
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS



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SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 21 Aug 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100																
0200																
0300																
0400																
0500																
1/2 630 0600	21-57	159-21	Kauai													23 / 10
0700	53	32														20 / 10
0800	56	42														30 10
0900	59	52														30 10
1009 1000	22-02	160-02	02		9	1013	26.9			3		2	26.7			30 10
1100	04	07														32 10
1200	08	12														32 09
1300	12	17														32 09
1400	16	23														32 09
1500	20	29														32 07
1600	24	35														32 08
1720 1700	22-28	160-40	02		9	1012	25.8			2		1	26.1			32 08
1800	31	45														32 08
1900	35	50														32 08
2000	38	55														32 08
2100	40	161-00														32 08
2200	46	161-05														34 06
2300	48	161-07														34 06
2400	50	161-09														32 06

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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Rev. 4-9-64

SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 22 Aug 64

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	22-51	161-17														29 / 08
0200	52	25														29
0300	53	33														29
0400	54	40														29
0500	55	48														29
0600	56	56														29
0700	57	162-00														29
0810 0800	22-58	162-06	02		9	1016	26.1			3		2	26.2			05 / 09
0900	23-00	162-02														13
1000	22-55	161-58														13 / 09
1100	50	51														13
1200	46	44														13
1300	42	37														13
1400	38	30														13
1500	34	23														13
1600	30	16														13
1700	26	09														13
1800	22	161-02														13
1900	18	160-55														13
2000	14	48														13
2100	10	40														13
2200	22-04	30														13
2300	22-02	20														13
2400	22-00	160-10														13

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS

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Rev. 4-9-64

SMITHSONIAN INSTITUTION  
DIVISION OF BIRDS  
AT SEA CLIMATOLOGICAL DATA

DATE 23 Aug 64 - Honolulu

TIME	LAT	LONG	PRES	WEA	VIS	SLP	DRY B	DEW PT	HUM %	TL SKY	OPA SKY	WAVES	SEA TEMP	WIND S	WIND D	SHIP COURSE/SPD.
0100	21-57	160-04														14 07
0200	54	159-58														14
0300	51	52														14
0400	48	159-46														14
0500	45	40														14
0600	41	34														14
0700	38	28														14
0800	35	22														14
0900	31	16														14
1000	28	10														14
1100	25	159-04														14
1200	21-21	157-58														05 11
1300	21-18	157-53														05
1400																
1500																
1600																
1700																
1800																
1900																
2000																
2100																
2200																
2300																
2400																

REMARKS:

ALL TIMES LOCAL (WHISKEY); WIND DIR. IN WHOLE DEGREES; WIND SPEED IN KNOTS; TEMPERATURES IN FAHRENHEIT; VISIBILITY IN NAUTICAL MILES;  
WAVES IN WHOLE DEGREES; WAVE PERIOD IN SECONDS; WAVE HEIGHT IN WHOLE FEET; SEA LEVEL PRESSURE IN MILLIBARS